

## STATEMENT OF CONSIDERATIONS

### **REQUEST BY M4 ENVIRONMENTAL L.P. FOR ADVANCE WAIVER OF DOMESTIC AND FOREIGN PATENT RIGHTS IN SUBJECT INVENTIONS MADE IN THE COURSE OF OR UNDER DEPARTMENT OF ENERGY CONTRACT NO. DE-AC05-96OR22467; DOE WAIVER DOCKET W(A)-96-010 [ORO-627]**

M4 Environmental L.P. (M4) has made a timely request for an advance waiver of worldwide rights in Subject Inventions made in the course of or under Department of Energy (DOE) Contract No. DE-AC05-96OR22467, a cost-sharing contract intended to confirm the operational reliability, safety and cost-effectiveness of technology, exclusively licensed by M4 for processing hazardous, radioactive and mixed wastes of DOE, for treatment of DOE's low level mixed waste (LLMW) which is both hazardous and radioactive. The licensed technology includes Catalytic Extraction Processing (CEP) and Quantum-CEP™ (Q-CEP) which are proprietary and patented processes owned by Molten Metal Technology, Inc. (MMT). CEP utilizes molten metal to convert hazardous wastes into useful industrial products and Q-CEP is a related technology for processing radioactive and mixed waste into valuable industrial products and partitioning the radioactive elements into a solid, tight bound matrix. The DOE Oak Ridge Operations Office will make available to M4 at least two specific waste streams representative of waste types occurring on the Oak Ridge Reservation for pilot-scale demonstration of waste treatment capabilities. The work will be performed in two phases with the first phase consisting of the pilot-scale treatment demonstration on an oil/solvent mixture and the second phase, which will be performed at DOE's option, consisting of a similar demonstration on a waste stream generally characterized as containerized soils.

In September of 1993, DOE awarded a cost-share contract to MMT to establish the commercial capability of the CEP process to treat radioactively contaminated scrap metal. One of the main tasks of that contract was testing of surrogate materials to validate the predicted partitioning of radio nuclides, ascertain appropriate materials handling techniques, establish the desired reactor design and provide characterization of product phases. The present contract is a follow-on contract with M4, composed of a limited partnership between Lockheed Martin Corporation and MMT, which will build on the previous surrogate work and extend the operating envelope of the CEP process to include actual DOE mixed low level waste.

The total estimated value of the contract is estimated to be about \$2.238 Million with M4 cost sharing \$738,540 which amounts to thirty three percent of the cost. This cost share is well above the minimum twenty percent cost share normally required to support an advance waiver. The contract period of performance is approximately 16 months.

M4 has invested approximately \$30 Million, with about \$2 Million of that amount being reimbursed by the U.S. Enrichment Corporation and the remainder being from M4's private funds, in the M4 Technology Center which has more than 75,000 square feet of manufacturing space for converting hazardous and LLMW material into useful industrial products. M4 also has a full time technical staff of approximately 150 technical people working to develop the CEP and Q-CEP for application to hazardous and mixed waste. Three Q-CEP Radioactive Processing Units have been installed in the Technology Center and a fourth is expected to be fully operational in June 1996. The first unit is a pilot facility that has successfully demonstrated the efficacy of Q-CEP in converting depleted uranium hexafluoride to environmentally stable uranium oxide compounds and commercial products. The second system is a bench-scale system for initial waste stream testing and analysis, and the third unit has processed 15 to 20 kilograms per hour of LLMW and hazardous wastes generated by local DOE sites. The fourth unit, which will begin full scale waste processing in June 1996, will have the capability to process five million kilograms of mixed waste per year.

As stated above, M4 has exclusive field of use licenses in CEP and Q-CEP technology. These technologies are covered by a broad spectrum of U.S. patents, a sample of which are listed in the waiver petition submitted by M4. The listed patents and patent applications are believed to substantially cover the technology to be used under the subject contract and any Subject Inventions conceived under the contract are likely to be limited to improvements in the patented technology. Also, M4 has stated that it believes that all inventions disclosed in its petition for patent waiver have been reduced to practice for application to hazardous waste and mixed waste. Such actual reduction to practice would preclude any of the patents/patent applications from being considered to be Subject Inventions under the contract based on the definition of Subject Invention to include inventions of the contractor which are first actually reduced to practice under the contract. Under these circumstances, granting of the requested waiver is unlikely to substantially affect the established patent position of M4 or MMT in the CEP and Q-CEP technology. Accordingly, granting of the waiver should not, per se, place M4 or MMT in a preferred or dominant market position in the field of processing hazardous, radioactive or mixed waste. Additionally, this field is a large one with many companies competing using alternative technologies such as incineration, plasma furnaces, molten metal oxidation, vitrification, ion exchange, soil washing and thermal desorption.

There are no known Governmental regulations which require or might require use of the technology which is the subject of the contract and this waiver. The work does not directly concern the public health, safety or welfare although the ultimate objective of demonstrating technology for processing hazardous radioactive and mixed wastes would have an impact on public health and safety, if successful.

The interest of the United States and the General Public will best be served by granting of the requested waiver insofar as the waiver will increase the likelihood that any inventions made under the contract will be used in subsequent commercial M4 ventures using MMT licensed technology. On the other hand, other competing commercial companies, which are unable to obtain a license to practice the underlying MMT patented technology (M4 has an exclusive field of use license which would preclude additional licenses in the same field), are unlikely to be interested in inventions which represent improvements to that technology. M4 has represented that, under the agreement which created M4, ownership of CEP or Q-CEP related inventions made by M4 employees would be assigned to MMT and MMT would include in M4's license all such inventions as well as others made by MMT or other MMT licensees. Any assignment of Subject Inventions by M4 to assignees other than MMT will be subject to written approval of the Contracting Officer and any assigned inventions will be subject to a non-exclusive, non-transferable, irrevocable, paid-up license to practice or to have practiced for or on behalf of the United States the waived invention, DOE March-in-Rights, U.S. Preference and U.S. Competitiveness provisions. Ultimate ownership of the inventions by MMT will ensure that the owners/licensees of the underlying technology will also own/license any improvements in that technology and this will promote integration of these improvements into future commercial ventures of M4 and MMT.

In the previous contract with MMT discussed above, MMT agreed that upon written application by DOE, it would enter into good faith negotiations to grant to the Government, for purposes of practicing the CEP Technology by or for the Government for the purpose of remediation or decontamination of chemically contaminated or radioactive DOE sites, nonexclusive license(s) under any background patent, limited rights data or restricted computer software on terms that are mutually acceptable and reasonable under the circumstances, including royalty rates that are consistent with commercial rates under comparable circumstances. Under certain circumstances, MMT could request relief from this Government licensing obligation from the Director of Environmental Restoration and Waste Management or designee.

### **Conclusions/Recommendations**

It is believed that granting this advance waiver will facilitate the commercialization of any inventions made under the contract, that such commercialization will inure to the benefit of the United States and the general public, and that no adverse effects on competition or market concentration will result. If M4 or its assignee do not make reasonable efforts to utilize a waived invention, DOE can exercise its March-in Rights to require licensing of the invention to a responsible applicant or applicants.

Accordingly, in view of the acceptable level of cost sharing by M4, the statutory objectives to be obtained and the factors to be considered under DOE's statutory waiver policy, the objectives of Public Law 101-189, and the Executive Order 12591, all of which have been considered, it is believed that the grant of this advance waiver, as set forth above, will best serve the interest of the United States and the general public. It is therefore recommended that the waiver be granted.

[REDACTED]  
[REDACTED]  
Stephen D. Hamel  
Office of Intellectual Property Counsel  
Oak Ridge Operations Office

Based on the foregoing Statement of Considerations and the representations in the attached Waiver Petition, it is determined that the interest of the United States and the general public will best be served by waiver of United States and foreign rights as set forth herein and, therefore, the waiver is granted. This waiver shall not apply to a modification or extension of the contract where, through the modification or extension, the purpose, scope or cost of the contract has been substantially altered.

## CONCURRENCE:

[REDACTED]  
James A. Tufi, Director  
Office of Western Operations

Date:

July 25, 1996

## APPROVAL:

[REDACTED]  
Paul A. Gottlieb  
Assistant General Counsel for Technology  
Transfer and Intellectual Property

Date:

8-2-96

W(A)-96-010  
ORO-627

WAIVER ACTION ABSTRACT

<u>REQUESTOR</u>	<u>CONTRACT SCOPE OF WORK</u>	<u>RATIONALE FOR DECISION</u>	<u>DISPOSITION</u>
M4 ENVIRONMENTAL L.P.	DEMONSTRATE RELIABILITY, SAFETY AND COST EFFECTIVENESS OF TECHNOLOGY LICENSED BY M4 FOR PROCESSING HAZARDOUS, RADIOACTIVE AND MIXED WASTES OF DOE.	SUBSTANTIAL COST SHARING BY M4 AND ESTABLISHED PATENT POSITION BASED ON LICENSED TECHNOLOGY. CONSOLIDATING OWNERSHIP OF IMPROVEMENTS IN A SINGLE ENTITY WHICH OWNS THE BASIC PATENTS SHOULD IMPROVE THE LIKELIHOOD THAT THE IMPROVEMENTS WILL BE COMMERCIALIZED.	GRANT ADVANCE WAIVER OF U.S. AND FOREIGN PATENT RIGHTS.